January 26, 2006

MEMORANDUM

To: David Anderson, Engineering Manager
Twin Falls Regional Office

From: Steve M. Ogle, P.E., Staff Engineer
State Office of Technical Services

Subject: Staff Analysis for Draft Wastewater-Land Application Permit No. LA-000103-05
Glanbia Foods, Inc., Gooding

1. PURPOSE

The purpose of this memorandum is to satisfy the requirements of the *Wastewater-Land Application Permit Regulations*, IDAPA 58.01.17.400, for issuing wastewater-land application permits (WLAPs). This memorandum addresses WLAP No. LA-000103-05, for the cheese and whey processing facility operated by Glanbia Foods, Inc. (GFI), and located in Gooding, Idaho.

2. SUMMARY OF EVENTS

Wastewater from GFI's Gooding facility is currently land-applied under the terms and conditions of WLAP Nos. LA-000103-02 and -04, dated April 2, 1999, and October 25, 2004, respectively. The 1999 permit is commonly referred to as the "Arkoosh" permit, while the 2004 permit is known as the "Wolfe" permit.

Prior to 2003, the facility's entire wastewater land-application operation was regulated under the Arkoosh permit; these existing operations were expanded by an additional 530 acres under the terms of the Wolfe permit (i.e., issued in 2003). Each of the two WLAPs addresses one of two distinct wastewater-land application site-locations, and both permits are generally concerned with direct land-application treatment of raw, industrial wastewater produced at the Gooding facility.

On September 19, 2003, GFI submitted a permit renewal application to the Idaho Department of Environmental Quality (DEQ) for the Arkoosh permit, which was scheduled to expire on March 22, 2004. Although DEQ has not yet issued a renewed permit (i.e., prior to the current draft permit addressed by this memorandum) in response to GFI's application, the facility has generally continued to operate the affected land application systems under the terms of the Arkoosh permit.

The Wolfe permit was initially issued as WLAP No. LA-000103-03 on April 28, 2003; however, that version of the Wolfe permit was contested by GFI and some local area residents after issuance. In May of 2004, the contested case petitions were resolved though a settlement agreement between each of the residents, GFI, and DEQ. This settlement agreement required re-issuance of the Wolfe permit with certain terms and conditions, and the Wolfe permit was subsequently reissued as WLAP No. LA-000103-04 in October of 2004.

As a result of the settlement agreement, GFI is also required to construct and operate a wastewater plant for pretreatment of the raw wastewater stream prior to final land-application treatment. Under the settlement agreement, the reissued Wolfe permit, called the "Interim Permit" in the agreement, is intended to be in place until construction of the pretreatment system, at which time a new permit called the "Combined Permit", is to be issued. The Combined permit is further explained in the following paragraph.

In anticipation of a late-2005 startup date for the pretreatment plant (i.e., the original startup date in the settlement agreement has subsequently been revised to January 31, 2006), GFI submitted permit application materials in May of 2005 for the land-application of *pretreated* wastewater on all existing hydraulic management units (HMUs) in the Arkoosh and Wolfe permits. The May 2005 permit application from GFI is intended to consolidate both existing permits into a single, updated permit (i.e., the Combined permit) for all of GFI's existing land-application sites.

The 2004 settlement agreement, the September 2003 and May 2005 permit applications, and supplemental information from DEQ's internal source files were used to develop the current draft of the Combined permit. This draft permit is the preliminary version of the Combined permit referenced in Section 4 of the 2004 settlement agreement.

3. DISCUSSION

This section discusses regulatory and technical bases for terms and conditions within the draft version of the Combined permit. It also identifies relevant changes to existing permit conditions from the Arkoosh and Wolfe permits. Administrative changes and/or similar, non-technical aspects of the draft permit (e.g., Sections A-D, I, and J of the permit and similar, boiler-plate language within the permit) are not specifically addressed within this document.

Section 4 of the 2004 settlement agreement provides that the settling neighbors will not object to the Combined permit so long as the permit contains "…terms and conditions…at least as protective of human health and the environment as the terms and conditions set forth in [the Settlement] Agreement, and the terms and conditions of the Interim permit [i.e., the Wolfe permit]." Consequently, in an effort to maintain these protective levels while consolidating conditions from the two permits, several conditions and requirements developed for the Wolfe permit have now been applied and/or extended to the Arkoosh sites under the terms of the Combined permit.

3.1 Site-Specific Permit Conditions – Section E

3.1.1 Wastewater Pretreatment System Requirement

Section 1 of the 2004 settlement agreement requires that the pretreatment plant consist of an anaerobic digestor followed by aerobic treatment (biological nutrient reduction with activated sludge treatment). The pretreatment system is also to be maintained and operated in good working order as long as the facility is in operation and GFI land-applies its wastewater. These provisions have been incorporated into Section E of the Combined permit.

3.1.2 Wastewater Pretreatment System Effluent Requirements

Section 1 of the 2004 settlement agreement establishes effluent performance standards for wastewater exiting the pretreatment system. Specifically, the agreement requires that the effluent shall contain no more than 50 parts per million (ppm) biological oxygen demand (BOD) and no more than 50 ppm total suspended solids (TSS). Additionally, Section 1.b of the settlement agreement specifies that compliance with these standards will be based on a 24-hour flow-proportional composite sample of effluent from aerobic plant outlet. These effluent standards and the associated averaging period have been incorporated into Section E of the Combined permit.

The monitoring frequency for the effluent sampling events is addressed in Section F of the draft permit; refer to Section 3.2.5 of this memorandum for a specific discussion of these monitoring provisions.

It should be noted that the effluent requirements are not applicable during periods of operational upset, or as otherwise delineated in a DEQ-approved Contingency Plan. This exception is intended to prevent situations where GFI could not comply with the permit due to temporary problems with pretreatment plant operation. Operational upsets are defined with the 2004 settlement agreement (i.e., the same definition appears in Section C of the Combined permit), and generally refer to "…unintentional and temporary non-compliance [with effluent performance standards] because of factors beyond the permittee's reasonable control." Other non-operational allowances, such as startup/shutdown due to routine maintenance events and the initial startup period required to initially bring the pretreatment system online after construction, will be required to address temporary operational fluctuations in the pretreatment plant; however such terms are not explicitly defined at the present time. These terms and related operational changes that will be implemented to the wastewater-land application system during such periods will be set forth in the Contingency Plan required by Compliance Activity No. CA-103-01 (refer to Section 3.4.2 of this document for a discussion of the Contingency Plan and CA-103-01).

3.1.3 Growing Season (GS) Maximum Hydraulic Loading Rate

The maximum GS hydraulic loading rate should *substantially* be the irrigation water requirement (IWR) for crop(s) grown on each HMU. Hydraulic loading rate includes the total volume of wastewater and supplemental irrigation water applied to each HMU. The Wolfe permit specifies the IWR as a GS hydraulic loading rate, while the Arkoosh permit allows a hydraulic loading rate based on corresponding constituent loading rate limits for chemical oxygen demand (COD) and/or nitrogen. In an effort to consolidate and update the two permits, the Combined permit specifies the IWR as the GS hydraulic loading rate applicable to all permitted HMUs used for wastewater land application. Additionally, implementation of the pretreatment plant should substantially reduce COD and nitrogen concentrations in the land-applied wastewater stream, thereby rendering the basis for the GS hydraulic loading rate limit in the Arkoosh permit irrelevant within the context of the Combined permit. The IWR is not explicitly specified as a hydraulic loading *limit* for each HMU, but rather, is given as the appropriate hydraulic loading rate agronomically necessary in acceptable cropping operations. This distinction is intended to allow some flexibility needed for proper crop management of the land application sites.

If possible during drought years, less acreage should be used and cropped, to insure the IWR of the crop is being met by irrigation water and wastewater. The facility should plan the amount of acreage to crop prior to the onset of each growing season, by use of estimated irrigation water storage and availability.

3.1.4 Non-Growing Season (NGS) Maximum Hydraulic Loading Rate Limit

The NGS hydraulic loading rate limit for each HMU is derived from the following equation:

$$HLR = AWC - Precipitation + Evapotranspiration$$

where: HLR = Hydraulic Loading Rate
AWC = Available Water-Holding Capacity of the soils onsite
Precipitation = Average Amount of Precipitation during NGS
Evapotranspiration = Evaporation/evapotranspiration during NGS

Table 3.1 shows the NGS HLR limits, as well as specific information used to estimate these limits, for each HMU on the Wolfe site. Section 3.d of the 2004 settlement agreement stipulates certain terms regarding parameters used to develop the specific NGS hydraulic loading limit contained in the Wolfe permit. The Combined permit contains the same NGS HLR limits as those in the Wolfe permit; refer to the permitting memorandum for the Wolfe permit (i.e., dated October 5, 2004) for a complete discussion regarding variables used to derive these NGS hydraulic limits.

Table 3.1: Non-Growing Season Hydraulic Loading Rate Limits for the Wolfe Sites

HMU	Field	Acreage	Soil AWC[a] (inches)	Precip.[b] (inches)	ET[c] (inches)	HLR[d] (inches)	HLR[d] (MG)	HLR/ HMU[e] (MG)
010312	Pivot 1	55.2	6.12	6.30	7.80	7.62	11.42	20.91
	Field 5	48.7	4.50	6.30	7.80	6.00	7.93	
	Field A	0.0	6.12	6.30	7.80	7.62	0.00	
	Field B	7.5	6.12	6.30	7.80	7.62	1.55	
010313	Pivot 2	118.0	5.67	6.30	7.80	7.17	22.97	22.97
010314	Field 3	52.6	6.10	6.30	7.80	7.60	10.86	24.46
	Field 4	48.7	7.20	6.30	7.80	8.70	11.50	
	Field E	4.1	7.20	6.30	7.80	8.70	0.97	
	Field H	5.5	6.10	6.30	7.80	7.60	1.14	
010315	Pivot 7	75.0	4.30	6.30	7.80	5.80	11.81	17.40
	Field D	13.4	5.10	6.30	7.80	6.60	2.94	
	Field F	16.4	4.30	6.30	7.80	5.80	2.11	
	Field G	3.4	4.30	6.30	7.80	5.80	0.54	
010316	Pivot 6	69.3	3.30	6.30	7.80	4.80	9.03	10.67
	Field C	12.6	3.30	6.30	7.80	4.80	1.64	
							Total:	96.42

[a]Available water-holding capacity. Taken from soil analysis contained in September 2003 submittal.
[b]Average precipitation during the non-growing season.
[c]Evaporation/evapotranspiration during the non-growing season; taken from AgriMet website (http://www.usbr.gov/pn/agrimet/webarcread.html). Represents average evaporation/evapotranspiration data for NGS months from 1987-2002.
[d]Non-growing season hydraulic loading rate limit in inches and in million gallons.
[e]Non-growing season hydraulic loading rate limit per HMU in million gallons.

The existing NGS HLR limits from the Arkoosh permit have been reevaluated and slightly revised for the Combined permit, as discussed in the following bullet list.

- Updated values for average precipitation and evaporation/evapotranspiration have been applied in the NGS HLR equation. Evaporation/evapotranspiration data for NGS months from 1987-2002 were taken from the AgriMet website and averaged to derive these updated values.
- The permitted HMU acreages are based solely on "application areas" of each HMU, as opposed to the total pivot areas used in the Arkoosh permit (i.e., "total areas" under sections of Pivots 2, 4, 5, and 6 include rocky outcrops, which are not permitted for wastewater application).
- Values for the AWC of individual soil-types on each HMU are taken directly from the September 19, 2003, permit renewal application. These individual values were then used to develop an overall, composite AWC estimate for each HMU, based on the percentage of each individual soil-type present on each HMU.

  GFI's permit renewal application presents slightly different composited AWCs for HMUs containing areas of uncultivated vegetation. GFI did not consider these areas in the composited summation for estimation of the overall AWC value for each HMU; however, these areas receive wastewater and are vegetated areas that should be included in the total AWC estimate. Consequently, DEQ has revised composite AWC value for each HMU; refer to Table 3.2 for a listing of DEQ's composite AWC values.

Table 3.2 shows the revised HLR limits, as well as the specific information used to estimate the revised limits, for the Arkoosh sites.

Table 3.2: Revised Non-Growing Season Hydraulic Loading Rate Limits for Arkoosh Sites

HMU	Field	Acreage	Soil AWC[a] (inches)	Precip.[b] (inches)	ET[c] (inches)	HLR[d] (inches)	HLR[d] (MG)	HLR/ HMU[e] (MG)
010301	Pivot 1	29.5	4.47	6.30	7.80	5.97	4.78	4.78
010302	Pivot 2	185.52	6.50	6.30	7.80	8.00	40.30	40.30
010305	Pivot 4	161.75	4.02	6.30	7.80	5.52	24.24	24.24
010306	Pivot 3	36.66	7.47	6.30	7.80	8.97	8.93	8.93
010307	Pivot 5	32.15	4.18	6.30	7.80	5.68	4.96	4.96
010308	Pivot 6	188.45	3.89	6.30	7.80	5.39	27.58	27.58
010309	Pivot 7	118.6	3.88	6.30	7.80	5.38	17.33	17.33
010310	Pivot 8	29.4	3.71	6.30	7.80	5.21	4.16	4.16
010311	Hand/ wheel	136.06	5.06	6.30	7.80	6.56	24.24	24.24
							Total:	156.52

[a]Available water-holding capacity; taken from U.S. Department of Agriculture information contained in GFI's September 2003 application renewal submittal.
[b]Average precipitation during the non-growing season.
[c]Evaporation/evapotranspiration during the non-growing season; taken from AgriMet website (http://www.usbr.gov/pn/agrimet/webarcread.html). Represents average evaporation/evapotranspiration data for NGS months from 1987-2002.
[d]Non-growing season hydraulic loading rate limit in inches and in million gallons.
[e]Non-growing season hydraulic loading rate limit per HMU in million gallons.

3.1.5 Runoff and Ponding Requirements

The language specified within the runoff and ponding requirements of the Wolfe permit is a direct result of the 2004 settlement agreement, and has been carried into the Combined Permit and applied to all permitted HMUs (i.e., Wolfe and Arkoosh sites).

3.1.6 Livestock Grazing Requirement

This permit condition requires any livestock grazing on the land application sites to be conducted in accordance with permittee's approved Grazing Management Plan. A grazing plan for the Wolfe sites was approved in a letter from DEQ to GFI dated November 11, 2003.

3.1.7 Allowable Crop Requirement

This requirement prohibits any crops for human consumption, and was taken from the Wolfe permit and applied to all permitted HMUs (i.e., Wolfe and Arkoosh sites).

3.1.8 Ground Water Quality Restriction

As specified in Section 3.f of the settlement agreement, the following language appears under the Ground Water Quality requirement within the Wolfe permit:

> "Wastewater land application activities conducted by the permittee shall not cause a violation of the *Ground Water Quality Rule* (GWQR), IDAPA 58.01.11, as now existing or later amended."

This language has been included in the Combined permit, and is now extended to all permitted HMUs on the Arkoosh and Wolfe sites.

3.1.9 Maximum COD Loading Rate Limit

Both the Arkoosh and Wolfe permits specify a GS and NGS COD loading rate limit of 50 pounds per acre-day. These COD loading rate limits have been carried into the Combined permit.

3.1.10 Maximum Nitrogen Loading Rate Limit

Although the averaging periods specified in each permit differ, both the Arkoosh and Wolfe permits limit the nitrogen loading rate for each HMU to 150% of crop uptake pounds per acre-year.

The Combined permit applies the same nitrogen loading rate limit (i.e., 150% of crop uptake), and applies the averaging period used in the Wolfe permit (i.e., the most recent 3-year period). For HMUs with less than 3 years of crop data, GFI must obtain DEQ approval for the methodology used to estimate crop uptake.

3.1.11 Maximum Total Dissolved Inorganic Solids (TDIS) Loading Rate Limit

Dissolved solids loading rate limits are generally based upon ground water concerns. GFI submitted a Total Dissolved Solids (TDS) Management Plan for the Arkoosh sites on December 14, 1999, and a TDS Impact Analysis for the Wolfe sites on May 2, 2005.

In a letter dated November 26, 2001, DEQ approved several best management practices (BMPs) from the 1999 TDS Management Plan and determined that the facility's 1999 and 2000 non-volatile dissolved solids (NVDS) loading rates were not likely to result in an adverse impact to groundwater quality; however, it is currently unclear if 1999 Plan will remain applicable to operations at the facility after the pretreatment plant is functional (i.e., the pretreatment plant is expected to reduce TDS loading to HMUs). At the present time, DEQ has not completed its review of the 2005 TDS Impact Analyses to assess the need for dissolved solids loading limits at the Wolfe sites.

Consequently, there are no NVDS or TDIS loading limits in the Combined permit draft. However, a re-opener clause is included in the event DEQ determines that this issue must be revisited at a later time.

3.1.12 Maximum Phosphorus Loading Rate Limit

No phosphorus loading limits are included in the Combined permit. However, a re-opener clause is included in the event DEQ determines that this issue must be revisited at a later time. Phosphorus loading rates are usually set by DEQ based upon either ground water or surface water concerns. With respect to ground water concerns, DEQ typically does not set a phosphorus loading limit where there is no direct interconnection between groundwater and surface water (i.e. where ground water discharging from the down-gradient boundary of the treatment site does not enter surface water). Such a direct connection does not exist at these sites.

Phosphorus can be a surface water concern if phosphorus bearing soils are subject to erosion and movement of sediments to surface water is possible. The runoff and ponding restrictions (refer to the discussion under Section 3.1.5 of this document) in Section E of the draft permit require GFI to manage the wastewater land application site in accordance with an approved Runoff Management Plan, required by Compliance Activity No. CA-103-03. The runoff management plan should implement control structures and other BMPs designed to prevent runoff from any site or fields used for wastewater land application given certain storm event conditions. This plan should prevent phosphorous from entering surface waters near the land application sites.

There is concern that phosphorus in surface soils may runoff after site closure (i.e., cease to be used for wastewater land treatment). In the event of any site closure during the term of the Combined permit, submittal of a closure plan is required under Section J of the permit. This closure plan should address soil phosphorus runoff as part of the site closure process.

3.1.13 Construction Plan Submittal Requirement

The Combined permit requires GFI to submit plans and specification for DEQ review and approval, prior to construction or modification of any wastewater facilities associated with the land application system. This is intended to allow ongoing regulatory oversight of any future modifications to the land application system and associated operations.

3.1.14 Buffer Zones and Wellhead Protection Restrictions

Buffer zone requirements specified in the Arkoosh permit reflect DEQ's standard permit language, used for buffer zone requirements at most industrial wastewater land application sites in the state of Idaho. The Wolfe permit also contains these standard buffer zone requirements; however, as a result of the 2004 settlement agreement, the Wolfe permit also contains several buffer zone provisions that are considerably more detailed and site-specific.

In the Combined permit, the standard buffer zone requirements have been applied to all permitted HMUs, and the specialized buffer zone requirements from the Wolfe permit have been included verbatim.

3.1.15 Posting Requirement

In order to prevent accidental or unintentional human exposure to wastewater, the Combined permit requires signs to be posted around the land application system, near all homes located around the perimeter of the site and at the entrance of all access roads into the site. The signs shall state "No Trespassing", or equivalent. This requirement was originally established under Section 3.l of the settlement agreement

3.1.16 Odor Management Requirement

The Combined permit requires the facility to comply with the DEQ-approved Nuisance Odor Management Plan. DEQ approved the current odor plan in a letter dated December 22, 2003.

3.1.17 Supplemental Irrigation Water Protection Requirement

This requirement originally appeared in the Wolfe permit, and has now been extended to all affected wastewater land application systems regulated in the Combined permit. The requirement mandates installation of a DEQ-approved backflow prevention device, where wastewater and irrigation water interconnections exist in the land application systems.

3.1.18 Waste Solids Management Plan Requirement

Provision No. 4 in Section I of the Combined permit generally requires that management of waste solids be governed by the terms of a DEQ-approved waste solids management plan. The Arkoosh sites have such an approved plan, referred to as the Sludge Management Plan; therefore, the Combined permit contains reference to the approved plans and allows application of specific waste solids in accordance with the approved plan. The Combined permit does not allow such application on the Wolfe sites, as GFI has no approved waste solids management plan for the Wolfe sites at this time.

3.2 Monitoring Requirements – Section F

The monitoring provisions needed to assess and/or establish ongoing compliance with site-specific permit requirements are given in the following sections of this memorandum.

3.2.1 Groundwater Monitoring Requirements – One-time Parameters

This requirement appeared in the Wolfe permit, and only applies to the dedicated monitoring wells for that site (i.e., Compliance Activity No. CA-103.4-03 in the Wolfe permit). It has been carried over to the Combined permit (i.e., because these wells have not yet been installed), and requires that initial groundwater parameters be collected after the dedicated monitoring wells are installed. These parameters will provide important baseline ground water chemistry information, and should be collected immediately after the wells are fully installed and developed. Parameters to be tested include bicarbonate/carbonate, sodium, calcium, magnesium, potassium, and sulfate.

3.2.2 Total Volumetric Flowrate Measurement Requirement – Daily Parameter

Section E of the Combined permit establishes a total, cumulative NGS hydraulic loading limit for all HMUs; therefore, GFI must monitor and record the total hydraulic load each year to assess compliance with the permit condition. Additionally, the total volume of pretreated wastewater and supplemental irrigation water land-applied must be monitored to allow quantification of individual hydraulic and constituent loading rates for each HMU (i.e., refer to the discussion in the following section of this document). Consequently, the total volumetric flowrate of wastewater exiting the 5-day holding pond has been included in the Combined permit as a monitoring requirement. This monitoring requirement specifies a daily recording basis, which was taken directly from the Wolfe permit. The monitoring point for this requirement is the discharge point of the 5-day holding pond, which reflects the flow configuration of the wastewater system after the pretreatment plant comes online.

It should be noted that, as required in Section E of the Combined permit, all land-applied wastewater and supplemental irrigation water (i.e., groundwater and surface/canal water) must be routed through the 5-day holding pond unless otherwise approved by DEQ in writing. Situations where deviations are likely to occur, or are scheduled to occur (e.g., plant maintenance and upkeep), should generally be identified/addressed within the Contingency Plan, required as part of the O&M Manual update provisions of Compliance Activity No. CA-103-01. The Contingency Plan must include concise process/flow descriptions that will be initiated during upset conditions, including sufficient monitoring and recordkeeping mechanisms to assess and verify wastewater flowrates.

Refer to Section 3.4.2 of this memorandum for a complete discussion of Compliance Activity CA-103-01 and the associated Contingency Plan requirements.

3.2.3 Total Volumetric Flowrate Measurement to Each HMU Requirement – Daily Parameters

Section E of the Combined permit establishes individual NGS hydraulic and constituent loading rate limits for each permitted HMU. To assess compliance with these requirements, the Combined permit requires that GFI monitor and record flow meter measurements of the influent stream at the Wolfe pumphouse and flow meter measurements for each HMU at the Wolfe site. Currently, individual flows to specific HMUs on the Arkoosh sites are not metered, but must be estimated with surrogate parameters (i.e., flowrates of influent stream at the Wolfe pumphouse and total effluent from the 5-day holding pond) and calculations to quantify the hydraulic and constituent loading to each HMU. Each HMU on the Wolfe sites is individually metered for measurement of the loading rate to each HMU on this site. These various monitoring parameters have been included in the Combined permit with a daily

recording basis, which is consistent with the monitoring/recording basis for total volume exiting the 5-day holding pond.

3.2.4 Field Conditions – Daily parameter during the NGS

This monitoring provision requires a daily visual assessment of field conditions observations (e.g., frozen, ice layer, areas of ponding, etc.) for each HMU in use during the NGS. The observations must be recorded, and are intended to demonstrate compliance with the Runoff and Ponding Requirements in Section E of the Combined permit. This provision originally appeared in the Wolfe permit, in an effort to ensure that proper NGS application techniques are used on the HMUs, but has been extended to all permitted HMUs under the Combined permit.

3.2.5 Wastewater Constituent Monitoring Requirements / BOD and TSS – Weekly Parameters

Section 1.b of the 2004 settlement agreement requires that wastewater exiting the pretreatment system "…be tested weekly for BOD and TSS, based on 24-hour flow proportional composite samples taken at the outlet of the aerobic plant." This requirement has been included in the monitoring section of the Combined permit, and will be used to assess compliance with the BOD and TSS effluent standards that appear in Section E of the permit.

3.2.6 Wastewater Constituent Monitoring Requirements / Biological Species – Variable Parameters

Section 1.c of the 2004 settlement agreement contains graduated monitoring requirements for the microorganisms *Salmonella*, *Shigella*, *Listeria monocytogenes*, and *Escherichia coli O157:H7*. Specifically, the agreement requires grab samples at the outlet of the anaerobic digestor to be taken: 1) weekly for the initial 7-months of pretreatment plant operations, 2) monthly for the following, 5-month period, and 3) quarterly thereafter. The agreement also specifies certain conditions and actions to be taken by GFI, in the event that a sample is found to contain the presence of any of these four microorganisms. These provisions have been incorporated into the Combined permit.

Section 1.d of the 2004 settlement agreement contains similar graduated monitoring requirements for the microorganism *Escherichia coli*. The agreement specifies grab samples at the outlet of the anaerobic digestor, to be taken: 1) weekly for the initial 7-months of pretreatment plant operations, 2) monthly for the following, 5-month period, and 3) quarterly thereafter. The agreement provisions have been incorporated into the Combined permit.

3.2.7 Wastewater Constituent Monitoring Requirements – Variable Parameters

In their 2005 permit renewal application, GFI requested that constituent sampling/monitoring of land-applied wastewater be reduced to a monthly provision (i.e., the Wolfe permit required weekly sampling for some constituents), as implementation of the pretreatment plant should result in a relatively constant wastewater effluent stream applied at the HMUs.

DEQ largely concurs with this assertion; however, the department notes that it may take some time for the plant to stabilize after startup. Consequently, a graduated monitoring requirement has been inserted into the Combined permit. The provision requires bi-weekly sampling and monitoring for the first 3 months of pretreatment plant operation, and a monthly schedule thereafter pending written DEQ concurrence with the change in monitoring frequency.

3.2.8 Irrigation Water Calculation Requirement – Monthly Parameter

The Combined permit required that GFI calculate the IWR for each crop type, on each HMU, and on a monthly basis. GFI is also required to identify the irrigation system efficiency, the method of calculation, and all references/sources for methodology used in each monthly calculation. This provision originally appeared in the Wolfe permit and was implemented in an effort to ensure that proper crop management techniques are used on the HMUs. This provision had been carried over into the Combined permit, and is now applicable to all permitted HMUs.

3.2.9 Groundwater Monitoring Requirements – Quarterly Parameters

The Combined permit requires GFI to pull quarterly groundwater samples from dedicated monitoring wells. Existing, dedicated monitoring wells for the Arkoosh sites are identified in Appendix 1 of the Combined permit; however, dedicated monitoring well locations for the Wolfe sites have not been finalized at this time (i.e., at the time this memorandum was prepared, the most recent correspondence regarding this issue was a letter to GFI from DEQ, dated October 5, 2004). Consequently, the Combined permit contains a note of clarification, indicating that the Wolfe monitoring wells are to be monitored quarterly, after installation. The parameters to be monitored are nitrate-nitrogen, total phosphorous, total dissolved solids, chloride, total iron, total manganese, total coliform, water table depth, water table elevation.

3.2.10 Soil Monitoring Requirements – Annual Parameters

The soil monitoring provisions of the Combined permit largely reflect the requirements of the Wolfe permit, and have been applied to all Soil Management Units (SMUs), as defined in Appendix 1 of the permit (i.e., Arkoosh and Wolfe sites). This sampling event is required annually, in April of each year.

The constituents to be monitored include both nitrate-nitrogen *and* ammonia, due to the agronomic and environmental interpretive value of these parameters.

Finally, it must be noted that the soil sampling requirements in the Arkoosh permit have been revised to reflect those of the Wolfe permit (i.e., ten sampling locations per HMU with three samples at three varying depths), although an allowance has been specified for smaller SMUs (i.e., five sampling locations for SMUs with 15 or less acres).

3.2.11 Seasonal Loading and Crop Assessment Requirements – Annual Parameters

These annual requirements require GFI to assess GS and NGS loadings for each HMU. The facility is also required to report information regarding the performance of the crops grown on each HMU as part of the loading assessment.

3.3 Reporting Requirements – Section H

Section H of the Combined permit contains monthly and Annual Report requirements. Essentially, the Annual Report should contain results from all work conducted during the previous annual period for each monitoring requirement listed in Section F of the permit. This section also contains reporting requirements for all compliance activities contained in the Combined permit.

3.4 Compliance Schedule for Required Activities – Section G

The Arkoosh and Wolfe permits contained several compliance activities (i.e., Sections F and G of each permit, respectively) that were to be performed after permit issuance. The following section discusses the status of these existing activities and then addresses new compliance activities implemented in the Combined permit.

3.4.1 Previous Compliance Activities in the Arkoosh and Wolfe Permits

Several of these existing compliance activities have been substantially fulfilled and/or require no further action by GFI. Similarly, some activities are one-time provisions that are no longer applicable within the framework of the Combined permit. For the Arkoosh permit, this includes CA-103-02, -03, -08, and -09. For the Wolfe permit, these activities include CA-103.4-01, -02, and -06. It should be noted that, although these activities will not be carried forward or readdressed under the Combined permit, several DEQ-approved submittals associated with these activities will remain in effect under the terms of the Combined permit; refer to Section B of the Combined permit for a complete list of materials that have been incorporated by reference into the permit.

Some issues associated with the existing compliance activities have not been resolved at the current time and may require additional information from GFI. The status of these issues has been updated and, if any action is required by GFI, carried forward into the Combined permit. Refer to Section 3.4.2 of this memorandum for a complete discussion of such ongoing issues.

Similarly, some compliance activities and related permit issues may be affected by introduction of the pretreatment plant and require no action by GFI at this time. Implementation of the pretreatment system will alter characteristics of land-applied wastewater and may address and/or resolve some historical concerns with the facility's land application operations. This includes historical TDS loading rates and the associated TDS Management Plan and TDS Impact Analysis (i.e., CA-103-05 in the Arkoosh permit and CA-103.4-05 in the Wolfe permit). DEQ will continue to assess these submittals in light of the pretreatment plant performance and, as needed, may request additional information and/or modify the Combined permit to address future TDS issues or concerns.

3.4.2 Compliance Activities Implemented in the Combined Permit

The following changes have been implemented to the Combined permit in order to facilitate requirements of the settlement agreement and/or to update the Combined permit to reflect the current status of permitting activities.

- The Wolfe sites are currently operated under an interim Plan of Operation, dated December 19, 2003, that was conditionally approved by DEQ in a letter dated December 24, 2003. The approval status only applied to certain land-application areas specified in the letter, due to on-going negotiations regarding the permit (i.e., the final plan could not be developed at that time). An approved Plan of Operation was also developed under the Arkoosh permit, in response to Compliance Activity No. CA-103-08 of the permit.

  The Plan(s) of Operation for the wastewater land application systems used by GFI must be updated to reflect implementation and operation of the pretreatment system. In particular, the Contingency Plan (i.e., originally required under Compliance Activity No. CA-103.4-03 of the Wolfe permit) must be expanded to address startup/shutdown operation(s) and upset conditions for the wastewater pretreatment plant. DEQ notes that the Contingency Plan submitted with the 2005 permit renewal application is insufficient and does not contain enough detail to merit approval by DEQ. The approved plan must include concise process/flow descriptions that will be initiated during upset conditions, including sufficient monitoring and recordkeeping mechanisms to assess and allow

DEQ-verification of wastewater flowrates during these events. Consequently, it is recommended that DEQ require an updated Contingency Plan, including pretreatment plant operations, be included as part of the updated Plan of Operation requirements in CA-103-01 of the Combined permit.

- Compliance Activity No. CA-103-04 requires GFI to evaluate certain aspects of the bases for the NGS HLR limits in the Combined permit. Specifically, this compliance activity is intended to address and clarify some uncertainty with the NGS evaporation/evapotranspiration (ET) parameter, which is used as a basis for the NGS HLR limits. Refer to Section 3.1.4 of this document for a discussion of the methodologies and parameters used to establish NGS HLR limits.

  When estimating the ET parameter from AgriMet data, current DEQ guidance (i.e., *Guidance for Land Application of Municipal and Industrial Wastewater, December 15, 2005*) stipulates that such ET values should be modified by a factor of 0.7, prior to use in the NGS HLR assessment. The adjustment factor is intended to account for reduced evaporation/evapotranspiration conditions during the NGS, due to snow cover and/or similar factors that may reduce the overall water-holding capacity of HMUs throughout the winter season. Although the NGS HLR limits in the Combined permit were derived, in part, by use of AgriMet data, it is unclear as to whether the adjustment factor given in DEQ's guidance, or some alternate value for the adjustment factor, is appropriate for GFI's land application sites. DEQ notes that the 0.7 adjustment factor has not historically been used in any WLAP issued for the Gooding facility.

  Consequently, DEQ has implemented CA-103-04 in the Combined permit in an effort to assess and ensure accuracy in the value of the ET parameter used to derive the NGS HLR limits for land application operations. Upon review of GFI's assessment work, DEQ will re-evaluate the NGS HLR limits currently contained in the Combined permit and may modify the Combined permit as necessary, to implement appropriate NGS HLR limits.

- Compliance Activity No. CA-103-05 in the Combined permit requires GFI to submit a permit application renewal package within six months of the permit's expiration date (i.e., to be documented in Section A of the permit upon final issuance).

Finally, the unresolved and/or lingering issues associated with certain compliance activities from the Arkoosh and/or Wolfe permits are discussed in the following bullet-item list.

- The site map required by Compliance Activity No. CA-103-01 of the Arkoosh permit may be affected by construction and/or implementation of the pretreatment system. Similar changes could be expected for the land application system for the Wolfe site. Consequently, DEQ is requiring that updated site maps be developed for both land application sites, as part of the updated Plan of Operation requirements in CA-103-01 of the Combined permit.

- The monitoring wells for the Wolfe sites (i.e., from CA-103.4-03 of the Wolfe permit) have not been completed; therefore, this requirement has been carried into the Combined permit as Compliance Activity No. CA-103-02.

- After the pretreatment system is complete and functional, characteristics of and/or land-application methods required for the pretreated wastewater could be impacted. This may also require revisions to the Runoff Management Plan (i.e., CA-103.4-04 of the Wolfe Permit), which was also required in Section 3.e of the 2004 settlement agreement. Consequently, DEQ is carrying this activity into the Combined permit as Compliance Activity No. CA-103-03.

3.5 Miscellaneous Permit Issues

3.5.1 Hydraulic Management Units – Nomenclature/Site Designations and Proposed Expansion Areas

In both the September 19, 2003, and the April 28, 2005, permit renewal applications, GFI proposed rather extensive revisions to the existing HMU designations and/or site delineations. The facility has asserted that such changes will simplify the permit and assist with site management.

DEQ notes that a change in existing HMU designations for existing wastewater application sites will interrupt the continuity of ongoing site monitoring records. The historic monitoring data for permitted HMUs are specific to each site, *as delineated by current HMU designations*. Environmental impacts of continued wastewater land application may take years to manifest within monitoring data, and maintaining the historical integrity of all site-monitoring data is a crucial aspect of proper site management and ongoing regulatory oversight. Interrupting these datasets by rearranging site boundaries or designations could easily induce uncertainty or errors in data interpretation; therefore, DEQ has not modified any existing HMU nomenclature, nor any existing HMU boundaries or other area designations in the Combined permit.

In the April 28, 2005, permit application, GFI proposed the use of several new areas for wastewater application. The application materials do not include sufficient site-specific assessments for these areas (e.g., locations of existing structures and/or wells, etc.), nor do the materials include acreages for these proposed areas. Although these areas largely appear to be extensions of currently permitted HMUs, DEQ has not included any new HMUs within the Combined permit, due to the limited amount of information provided in the permit application materials.

DEQ notes that GFI can resubmit an HMU expansion request at any time; however, the request should include sufficient information, as well as appropriate support documentation, to characterize each site, including information required to assess permitting criteria (e.g., NGS HLRs for each proposed HMU, etc.).

4. RECOMMENDATIONS

Based on review of applicable state rules, staff recommends that DEQ issue draft WLAP Permit No. LA-000103-05 for a public review and comment period.